FACT SHEET FOR NPDES PERMIT WA-003128-3
SULEX, INC.

GENERAL INFORMATION	
Applicant	Sulex, Inc.
Facility Address	13221 Farm to Market Road Mount Vernon, WA 98273
Type of Facility	Prilled Sulfur and Sulfur Emulsion Manufacturing
SIC Code	2819
Discharge Location	Waterbody name: Padilla Bay Latitude: 48° 27' 16" N Longitude: 122° 26' 28" W
Water Body ID Number	WA-03-0020

TABLE OF CONTENTS

INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), which is administered by the Environmental Protection Agency (EPA). The EPA has delegated responsibility to administer the NPDES permit program to the State of Washington on the basis of Chapter 90.48 RCW which defines the Department of Ecology's authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the State include procedures for issuing permits (Chapter 173-220 WAC), water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least thirty (30) days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see Appendix A--Public Involvement of the fact sheet for more detail on the Public Notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. Comments and the resultant changes to the permit will be summarized in Appendix C--Response to Comments.

BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

HISTORY

Sulex, Inc. (formerly Smith & Ardussi), took over the operation of this sulfur production plant which manufactures prilled sulfur and sulfur emulsion products in June 1995. The plant is located near Mount Vernon, Skagit County.

INDUSTRIAL PROCESS

The plant operates two 8-hour shifts depending on market demand and availability of feed stock. The plant operates two different processes: sulfur prilling and sulfur emulsion production. Prilled high grade sulfur product is sold overseas and the low grade product is sold to local farmers as fertilizer. Sulfur emulsion (Sulpreme) is sold to the pulp mill industry. Eighty percent of the facility is paved, which includes the process and product storage areas.

The plant receives molten sulfur from various refineries and stores it in two storage tanks at a temperature of 280° to 290° F. In the sulfur prilling process, feed stock is sprayed into a tank of water in which the sulfur is prilled into small, substantially dust-free pellets. The water-sulfur mixture is then removed from the tank and screened to separate the sulfur. Prilled sulfur product is then elevated and conveyed to a warehouse while the water is recycled to the prilling tank and reused in the process. Since some water is lost through this process, and the temperature of the water in the prilling tank needs to be controlled, makeup water is added to the tank.

In the emulsion producing process, molten sulfur and a water solution (containing 2% biodegradable organics, 0.1% biocide) are emulsified to produce a cooking liquor for the pulp mill industries, called Sulpreme, which contains 70% sulfur by weight.

WASTEWATER MANAGEMENT AND DISCHARGE OUTFALL

Wastewater discharged consists of storm runoff from the yard, leachate from storage products and occasional filter-pressed washdown water from the emulsion process and boiler blowdown water. This water is collected in a large concrete three-chamber catch basin (treatment pond) where sedimentation and pH treatment are provided prior to discharge to an unlined man-made settling pond which is shared with neighboring Hughes Farms (potatoes washer). The treated water is discharged to Little Indian Slough, which ultimately discharges to Padilla Bay.

Treatment systems include a caustic additive system for pH adjustment, a recirculation pump, an air eductor for aeration, and two bag filtration systems for the final effluent. The concrete catch basin is equipped with a pit sensor (see attached schematic). The size of the treatment pond was evaluated to determine if it was adequate to contain flows resulting from a two-year storm event.

The emulsion sulfur plant's washdown water is directed to a concrete vault located adjacent to the emulsion plant. Historically, overflow water from the vault was directed into a nearby stormwater catch basin and routed to the treatment pond. Sulex has recently removed the overflow line from the vault. Washdown water is now pumped from the vault into a holding tank, where the water is mixed with a flocculent. The flocculated water is then pumped through a filter press into a storage tank (see attached site plan). The storage tank has the capacity to hold the water from several washdown cycles. Sulex proposed to periodically pump or gravity feed the treated water (low pH) from the storage tank to the stormwater catch basin which ultimately drains to the treatment pond.

Process wastewater from the prilling process collected in a separate concrete catch basin which is located east of the sulfur plant. This water is recycled for reuse in the prilling operation. The catch basin contains two chambers for sedimentation/filtration.

PERMIT STATUS

The previous permit for this facility was issued on June 24, 1998. The previous permit contained effluent limitations on TSS, sulfide (H_2S), dissolved oxygen, and pH. An application for permit renewal was submitted to the Department on December 10, 2002, and accepted by the Department on March 16, 2004.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

During the history of the previous permit, the Permittee has had the following violations based on Discharge Monitoring Reports (DMRs) submitted to the Department.

A warning letter was issued to the facility on April 16, 2003, for not reporting temperature during the months of October, November, and December of 2002.

WASTEWATER CHARACTERIZATION

The proposed wastewater discharge was characterized for the following regulated parameters:

Parameter	Maximum Conc.
Dissolved Oxygen	98 ppm (75%) (based on DMRs)
Total Suspended Solids	20 ppm (based on DMRs)
pH	6.4 to 9 s.u. (based on DMRs)
Sulfate (as SO_4)	15 ppm
Sulfide (as S)	trace
Sulfite (as SO_3)	<15 ppm
Temperature	57° F (based on submitted DMRs)

PROPOSED PERMIT LIMITATIONS

Federal and State regulations require that effluent limitations set forth in an NPDES permit must be either technology- or water quality-based. Technology-based limitations are based upon the treatment methods available to treat specific pollutants. Technology-based limitations are set by regulation or developed on a case-by-case basis (40 CFR 125.3, and Chapter 173-220 WAC). Water quality-based limitations are based upon compliance with the surface water quality standards (Chapter 173-201A WAC), ground water standards (Chapter 173-200 WAC), sediment quality standards (Chapter 173-204 WAC) or the National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992). The more stringent of these two limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis. The limits necessary to meet the rules and regulations of the State of Washington were determined and included in this permit. Ecology does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department of Ecology.

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

Technology-based limitations are set by regulation in the federal effluent guidelines or on a case-by-case basis using best professional judgment (BPJ) when no effluent guidelines exist for an industrial category. Technology-based limits represent the best treatment a facility can achieve consistent with the economic means of the industry as a whole (in the case of effluent guidelines) or of the specific facility being permitted (in the case of BPJ).

The effluent limitations for TSS are set at 45 mg/L for maximum daily and 30 mg/L for average monthly, the same as in the previous permit.

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established surface water quality standards. The Washington State surface water quality standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state. Surface water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin wide total maximum daily loading study (TMDL).

NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

"Numerical" water quality criteria are numerical values set forth in the state of Washington's water quality standards for surface waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the water quality standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

The U.S. EPA has promulgated 91 numeric water quality criteria for the protection of human health that are applicable to Washington State (EPA 1992). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

NARRATIVE CRITERIA

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the state of Washington.

ANTIDEGRADATION

The state of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when the natural conditions of a receiving water are of higher quality than the criteria assigned, the background conditions shall constitute the water quality criteria. More information on the Washington State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

The Department has reviewed existing records and is unable to determine if ambient water quality is either higher or lower than the designated classification criteria given in Chapter 173-201A WAC; therefore, the Department will use the designated classification criteria for this water body in the proposed permit. The discharges authorized by this proposed permit should not cause a loss of beneficial uses.

CRITICAL CONDITIONS

Surface water quality-based limits are derived for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses.

MIXING ZONES

The water quality standards allow the Department of Ecology to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available and reasonable methods of prevention, control and treatment (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria.

DESCRIPTION OF THE RECEIVING WATER

The facility discharges to a roadside ditch which flows into Little Indian Slough, which ultimately discharges to Padilla Bay, which is designated as a Class "A" marine water in the vicinity of the outfall, located approximately two miles to the northwest of the facility. Several other industries are located adjacent to, or in the vicinity of, the Sulex plant and discharge waters to Padilla Bay, including Skagit County Transfer Station and Hughes Farms. Characteristic uses include the following:

Stock watering; fish migration; fish and shellfish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation. Water quality of this class shall markedly and uniformly exceed the requirements for all or substantially all uses.

SURFACE WATER QUALITY CRITERIA

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA, 1992).

WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

The water quality-based effluent limitations set in this permit are dissolved oxygen (DO) and dissolved sulfide-hydrogen. The effluent limit for DO is set at a minimum of 70% of saturation concentration. The water standard, WAC 173-201A-030(2)(c)(ii)(A), for dissolved oxygen is 8 mg/L. As the temperature of the effluent varies, it is not practical to set a fixed DO concentration in the permit. Therefore, BPJ was used to set a limit of a minimum of 70% saturation (8 mg/L is 70% of saturation at 52^{o} F or 11^{o} C). The fresh water data table for DO in the permit on page 6 was used instead of that for marine water, due to the fact that the effluent is initially discharged to an open ditch for several miles prior to reaching Padilla Bay. The effluent is expected to undergo some aeration prior to reaching marine waters.

The effluent limit for sulfide-hydrogen sulfide is set at 2.0 µg/L (ppb) maximum daily, Water Quality Criteria for Water 1986 (the EPA Gold Book). EPA has available data indicating that water containing concentrations in excess of 2.0 ppb would constitute a long-term hazard to fish and other aquatic wildlife. The best available test method, EPA Method 376.2 or Standard Method 4500-S^{-2} for hydrogen sulfide which has a detection limit of 100 ppb. For the interim, this method detection limit (MDL) will be used for assessment of compliance with the effluent limit. Measurement above 100 ppb will be considered evidence of exceedance of the effluent limit of 2.0 ppb. The permit will require Sulex to search a laboratory and conduct a feasibility study for the gas chromatography/flame photometric detection (GC/FPD) or the atomic absorption spectroscopy (AAS) test method which has a low detection limit for hydrogen sulfide. If it is demonstrated that a laboratory is capable of conducting one of the above-mentioned test methods, then that test method will be utilized to replace the EPA test method 376.2 for hydrogen sulfide testing for the remaining term of this permit.

The effluent limit for dissolved oxygen (DO) is to be no less than 6 mg/L (maximum daily), based on water quality criteria for Class A marine water. The critical time when the effluent can hold the least DO is the summer months between June and September. The effluent temperature in the settling pond in those summer months can be as high as 75º F (24º C). The equilibrium DO for

this worst case temperature is 8.53 mg/L (Wastewater Engineering, Metcalf & Eddy). Thus, the DO limit expressed in percent saturation is the ratio of the water quality criteria and this worst case DO equilibrium value. This ratio is 0.70 (or 70% DO saturation). The same limit was included in the previous permit and remains the same in this proposed permit. The Department has commented to Sulex that aeration may be necessary if the effluent cannot attain compliance with this percent saturation limit.

The effluent limit for pH is between 7 and 8.5 standard units, based on water quality criteria for Class A marine water.

WHOLE EFFLUENT TOXICITY

The water quality standards for surface waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing.

Whole effluent toxicity testing is not required during the treatment system modification. The effluent quality will be evaluated for the need for whole effluent toxicity testing after the modification is complete. The Department reserves the right to require additional monitoring through issuance of an administrative order or modification of this permit if it receives information indicating that toxicity may be present in the effluent.

HUMAN HEALTH

Washington's water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the state by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

The Department has determined that the applicant's discharge is unlikely to contain chemicals regulated for human health.

SEDIMENT QUALITY

The Department has promulgated aquatic sediment standards (Chapter 173-204 WAC) to protect aquatic biota and human health.

These standards state that the Department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

The Department has determined through a review of the discharger characteristics and effluent characteristics that this discharge has no reasonable potential to violate the sediment management standards.

GROUND WATER QUALITY LIMITATIONS

The Department has promulgated ground water quality standards (Chapter 173-200 WAC) to protect beneficial uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

Sulfate is proposed to be monitored in this permit on a batch basis as the treated effluent is discharged an unlined pond.

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

The monitoring schedule is detailed in the proposed permit under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring.

LAB ACCREDITATION

With the exception of certain parameters, the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories.*

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The conditions of S3 are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 273-220-210).

SPILL PLAN

The Department has determined that the Permittee stores a quantity of chemicals that have the potential to cause water pollution if accidentally released. The Department has the authority to require the Permittee to develop best management plans to prevent this accidental release under Section 402(a)(1) of the Federal Water Pollution Control Act (FWPCA) and RCW 90.48.080.

The Permittee has developed a plan for preventing the accidental release of pollutants to state waters and for minimizing damages if such a spill occurs. The proposed permit requires the Permittee to update this plan and submit it to the Department.

TREATMENT SYSTEM OPERATING PLAN

In accordance with state and federal regulations, the Permittee is required to take all reasonable steps to properly operate and maintain the treatment system (40 CFR 122.41(e)) and WAC 173-220-150 (1)(g). An updated *Operation and Maintenance Manual* will be submitted as required by state regulation for the construction of wastewater treatment facilities (WAC 173-240-150). It has been determined that the implementation of the procedures in the Treatment System Operating Plan is a reasonable measure to ensure compliance with the terms and limitations in the permit.

ANALYTICAL TEST METHOD FOR HYDROGEN SULFIDE

The Permittee is required to search a laboratory and conduct a feasibility study for the gas chromatography/flame photometric detection (GC/FPD) or atomic absorption spectroscopy (AAS) test for hydrogen sulfide in water with a detection limit of equal to or less than 2 µg/L. This study is required to be submitted to the Department by March 30, 2005. The reference to the GC/FPD test method for hydrogen sulfide is Radford-Knoery and Cutter 1993. The reference to the AAS test method for hydrogen sulfide is Parvinen and Lajunen 1994.

GENERAL CONDITIONS

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual industrial NPDES permits issued by the Department.

Condition G1 requires responsible officials or their designated representatives to sign submittals to the Department. Condition G2 requires the Permittee to allow the Department to access the treatment system, production facility, and records related to the permit. Condition G3 specifies conditions for modifying, suspending, or terminating the permit. Condition G4 requires the Permittee to apply to the Department prior to increasing or varying the discharge from the levels stated in the permit application. Condition G5 requires the Permittee to construct, modify, and operate the permitted facility in accordance with approved engineering documents. Condition G6 prohibits the Permittee from using the permit as a basis for violating any laws, statutes, or regulations. Conditions G7 and G8 relate to permit renewal and transfer. Condition G9 requires the Permittee to control its production in order to maintain compliance with its permit. Condition G10 prohibits the reintroduction of removed substances back into the effluent. Condition G11 states that the Department will modify or revoke and reissue the permit to conform to more stringent toxic effluent standards or prohibitions. Condition G12 incorporates by reference all other requirements of 40 CFR 122.41 and 122.42. Condition G13 notifies the Permittee that additional monitoring requirements may be established by the Department. Condition G14 requires the payment of permit fees. Condition G15 describes the penalties for violating permit conditions.

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary, to meet water quality standards for surface waters, sediment quality standards, or water quality standards for ground waters, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to control toxics, protect human health, aquatic life, and the beneficial uses of waters of the state of Washington. To be consistent with the Skagit/Stillaguamish permit issuance planning year, the Department proposes that this proposed permit be issued for five (5) years with an expiration year of 2009.

REFERENCES FOR TEXT AND APPENDICES

Chapter 173-20/A WAC, Water Quality Standards for Surface Waters of the State of Washington. November 25, 1992.

Environmental Protection Agency (EPA)

1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.

1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.

1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington, D.C.

1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.

1983. Water Quality Standards Handbook. USEPA Office of Water, Washington, D.C.

Tsivoglou, E.C., and J.R. Wallace.

NPDES Permit Application Submitted on December 10, 2002.

Washington State Department of Ecology.

2000. Permit Writer's Manual. Publication Number 92-109.

Wright, R.M., and A.J. McDonnell.

1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(EE2). (Cited in EPA 1985 op.cit.)

APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page one of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public Notice of Application (PNOA) was published on March 21 and 28, 2004, in The Skagit Valley Herald to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department published a Public Notice of Draft (PNOD) on May 24, 2004, in The Skagit Valley Herald to inform the public that a draft permit and fact sheet were available for review. Interested persons were invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents were available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments were mailed to:

Water Quality Permit Coordinator
WA State Department of Ecology
Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008-5452

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the thirty (30)-day comment period to the address above. The request for a hearing shall indicate the interest of the party and reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least thirty (30) days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

The Department will consider all comments received within thirty (30) days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, (425) 649-7201, or by writing to the address listed above.

This permit and fact sheet were written by Jeanne Tran, P.E.

APPENDIX B--GLOSSARY

AKART--An acronym for "all known, available, and reasonable methods of treatment."

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Average Monthly Discharge Limitation --The average of the measured values obtained over a calendar month's time.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD_5--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD_5 is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of a treatment facility.

Clean Water Act (CWA)--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite" (collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots).

Construction Activity--Clearing, grading, excavation, and any other activity which disturbs the surface of the land. Such activities may include road building; construction of residential houses, office buildings, or industrial buildings; and demolition activity.

Critical Condition--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Dilution Factor--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the percent effluent fraction, e.g., a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Engineering Report--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Grab Sample--A single sample or measurement taken at a specific time or over as short a period of time as is feasible.

Industrial Wastewater--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business; from the development of any natural resource; or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Major Facility--A facility discharging to surface water with an EPA rating score of >80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum Daily Discharge Limitation--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

Minor Facility--A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing Zone--An area that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in state regulations (Chapter 173-201A WAC).

National Pollutant Discharge Elimination System (NPDES)--The NPDES (Section 402 of the Clean Water Act) is the federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the state of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both state and federal laws.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Quantitation Level (QL)--A calculated value five times the MDL (method detection level).

Responsible Corporate Officer--A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or have gross annual sales or expenditures exceeding $25 million (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures (40 CFR 122.22).

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)--Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Upset--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-based Effluent Limit--A limit on the concentration of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C--PROCESS FLOW DIAGRAM

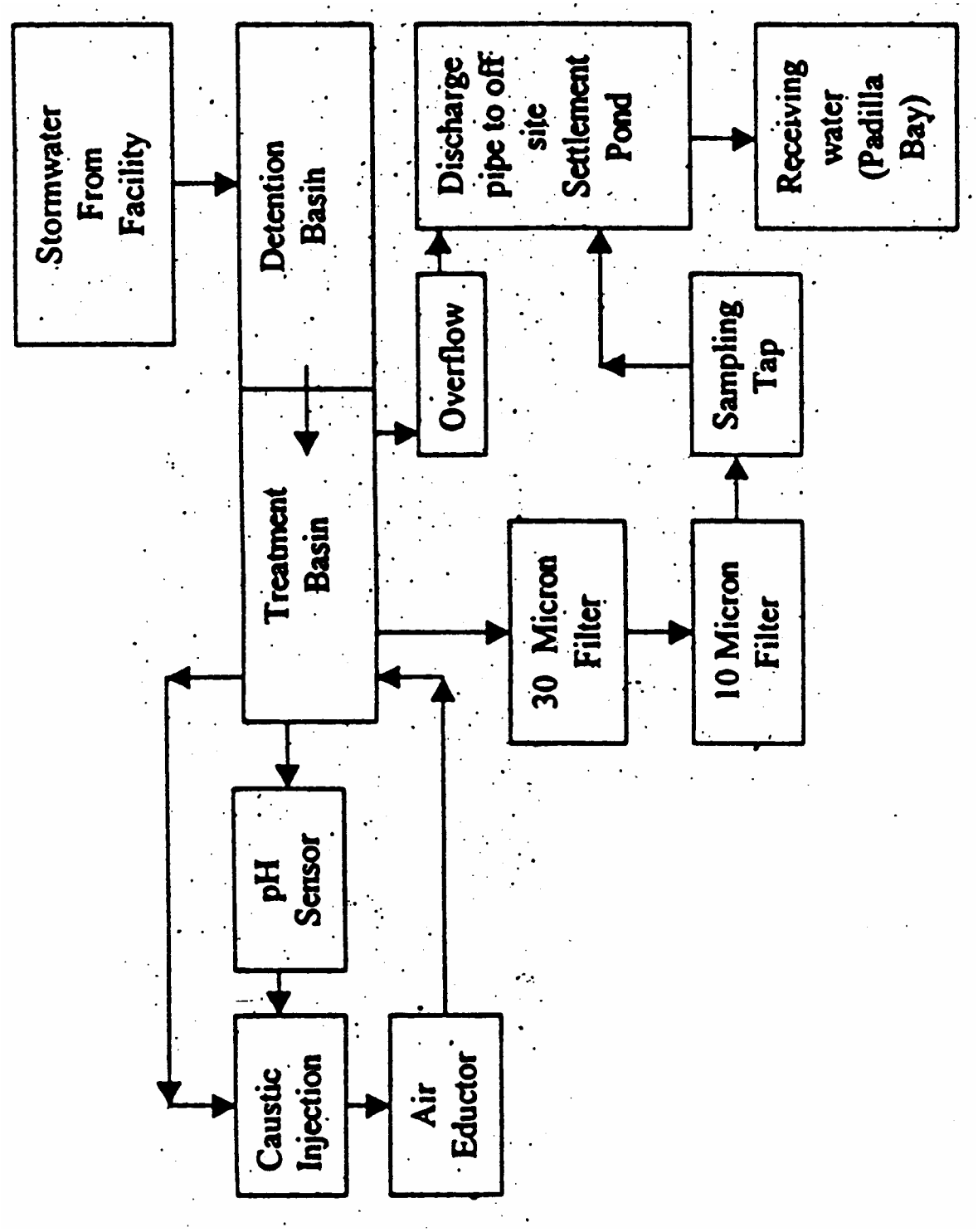

Figure 1.

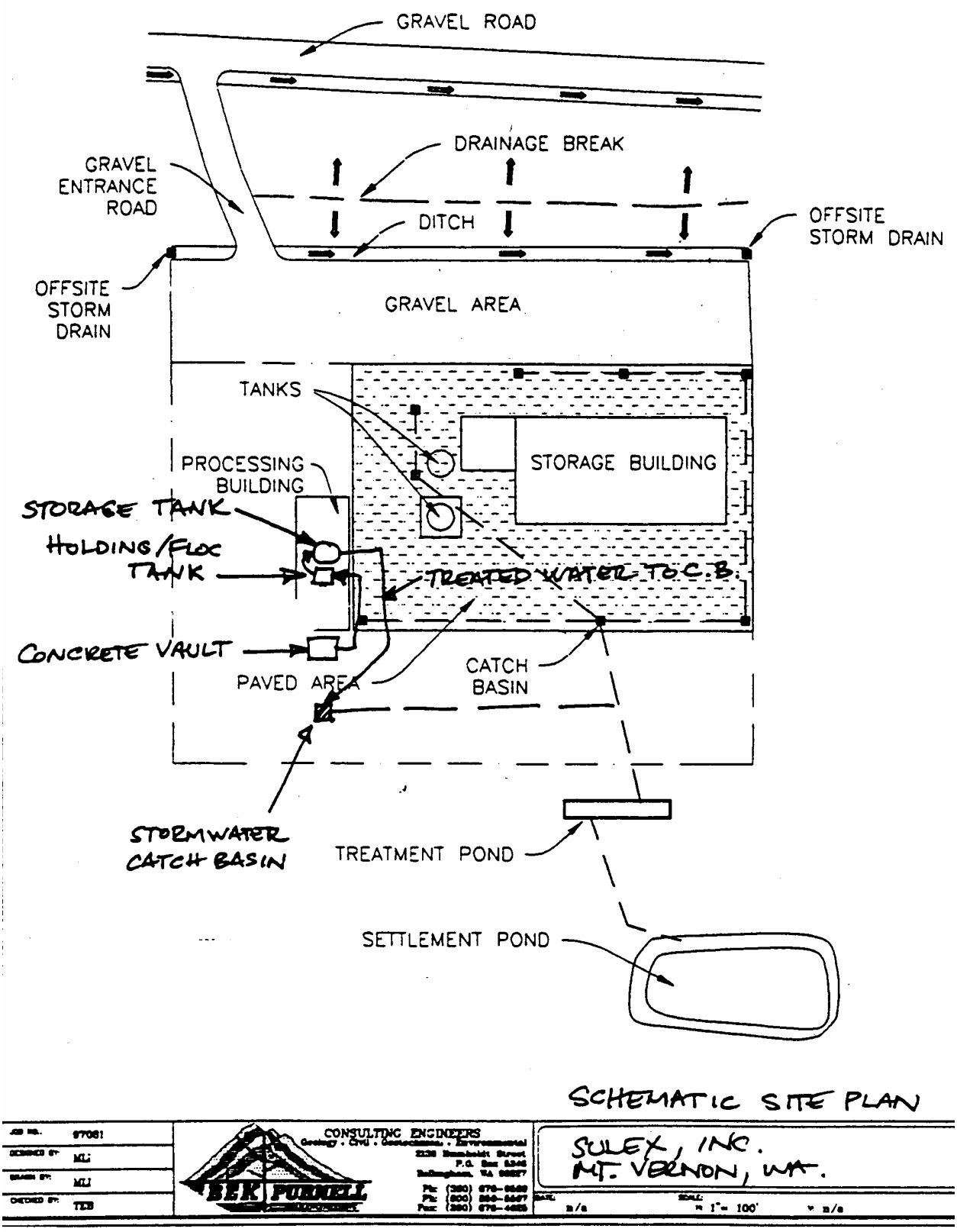
GRAVEL ROAD
DRAINAGE BREAK
GRAVEL ENTRANCE ROAD
DITCH
OFFSITE STORM DRAIN
OFFSITE STORM DRAIN
GRAVEL AREA
TANKS
PROCESSING BUILDING
STORAGE BUILDING
STORAGE TANK
HOLDING/FLOC TANK
TREATED WATER T.O.C.B.
CONCRETE VAULT
PAVED AREA
CATCH BASIN
STORMWATER CATCH BASIN
TREATMENT POND
SETTLEMENT POND
SCHEMATIC SITE PLAN
CONSULTING ENGINEERS
BEK PUDDELL
SULEX, INC.
MT. VERNON, WA.

Figure 2.

APPENDIX D--RESPONSE TO COMMENTS